

1.5 AMP NEGATIVE ADJUSTABLE VOLTAGE REGULATOR APPROVED TO DESC DRAWING 7703404



**Three Terminal, Precision Adjustable
 Negative Voltage Regulator In Hermetic
 Style Packages (LM137HV)**

FEATURES

- Similar To Industry Standard LM137HV
- Approved To DESC Standardized Military Drawing Number 7703404
- Built In Thermal Overload Protection
- Short Circuit Current Limiting
- Available In Six Package Styles

DESCRIPTION

These three terminal negative regulators are supplied in hermetically sealed packages. All protective features are designed into the circuit, including thermal shutdown, current-limiting, and safe-area control. With heat sinking, these devices can deliver up to 1.5 amps of output current. The LCC-20 device is limited to .5 amps. The unit also features output voltages that can be fixed from -1.2 volts to -47 volts using external resistors.

ABSOLUTE MAXIMUM RATINGS $T_c @ 25^\circ\text{C}$

Power Dissipation

| | |
|--------------------------|-------|
| Case 2 | 1.1 W |
| Case-All Others. | 20 W |

Input - Output Voltage Differential 50 V

Operating Junction Temperature Range - 55°C to + 150°C

Storage Temperature Range - 65°C to + 150°C

Lead Temperature (Soldering 10 seconds) 300°C

Thermal Resistance, Junction to Case:

| | |
|---|---------|
| Case 2, LCC-20 | 17°C/W |
| Case U & M, TO-257 (Isol) and SMD-3 | 4.2°C/W |
| Case T&N, TO-257 (Non-Isol) and SMD-1 | 3.5°C/W |
| Case Y, TO-3 | 3.0°C/W |

Maximum Output Current:

| | |
|--------------------------|------|
| Case 2 | .5 A |
| Case-All Others. | 1.5A |

Recommended Operating Conditions:

| | |
|--|---------------------|
| Output Voltage Range | -1.2 to -47 VDC |
| Ambient Operating Temperature Range (T_A). | - 55°C to + 125°C |
| Input Voltage Range | -4.25 to -51.25 VDC |

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ELECTRICAL CHARACTERISTICS -55°C T_A 125°C, I_L = 8mA (unless otherwise specified)
OM1323NTM, OM1323STM, OM1323NKM, OM1323SMM, OM1323NMM

| Parameter | Symbol | Test Conditions | Min. | Max. | Unit |
|----------------------------------|-------------------|--|------------|----------|------|
| Reference Voltage | V _{REF} | V _{DIFF} = 3.0V, T _A = 25°C | -1.275 | -1.225 | V |
| | | V _{DIFF} = 3.0V | -1.30 | -1.20 | |
| | | V _{DIFF} = 50V, T _A = 25°C | -1.275 | -1.225 | |
| | | V _{DIFF} = 50V | -1.30 | -1.20 | |
| Line Regulation (Note 1) | R _{LINE} | 3.0 V V _{DIFF} 40V, T _A = 25°C | -10 -25 | 10 25 | mV |
| Load Regulation (Note 1) | R _{LOAD} | V _{DIFF} = 5.0V, 8mA I _L 110mA T _A = 25°C | -25 | 25 | mV |
| | | V _{DIFF} = 5V, 8mA I _L 1.5A, T _A = 25°C | -25 -45 | 25 45 | |
| Thermal Regulation | V _{RTH} | V _{in} = -14.6V, I _L = 1.5A P _d = 20 Watts, t = 10 ms, T _A = 25°C | -5 | 5 | mV |
| Ripple Rejection (Note 2) | R _N | f = 120 Hz, V _{out} = V _{ref} C _{Adj} = 10 μF | 66 | | dB |
| Adjustment Pin Current | I _{Adj} | V _{DIFF} = 3.0V | | 100 | μA |
| | | V _{DIFF} = 40V | | 100 | |
| | | V _{DIFF} = 50V | | 100 | |
| Adjustment Pin Current Change | I _{Adj} | V _{DIFF} = 5V, 8mA I _L 1.5A | -5 | 5 | μA |
| | | 3 V V _{DIFF} 50V | -6 | 6 | |
| Minimum Load Current | I _{Lmin} | V _{DIFF} = 3.0V, V _{out} = -1.4V (forced) | | 3.0 | mA |
| | | V _{DIFF} = 10V, V _{out} = -1.4V (forced) | | 3.0 | |
| | | V _{DIFF} = 40V, V _{out} = -1.4V (forced) | | 5.0 | |
| | | V _{DIFF} = 50V, V _{out} = -1.4V (forced) | | 5.0 | |
| Current Limit (Note 2) | I _{CL} | V _{DIFF} = 5V | 1.5 | 3.5 | A |
| | | V _{DIFF} = 50V, T _A = 25°C | 0.2 | 1.0 | |

Notes:

1. Load and Line Regulation are specified at a constant junction temperature. Pulse testing with low duty cycle is used. Changes in output voltage due to heating effects must be taken into account separately.
2. If not tested, shall be guaranteed to the specified limits.
3. The • denotes the specifications which apply over the full operating temperature range.

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| PART NUMBER DESIGNATOR | | |
|--|--|--|
| Standard Military Drawing Number | Omnirel Part Number | Omnirel Package Designation |
| 7703404M 7703404U 7703404T 7703404Y 7703404N 77034042 | OM1323SMM OM1323STM OM1323NTM OM1323NKM OM1323NMM OM1323N2M | SMD-3 TO-257 (Isolated) TO-257 (non-Isolated) TO-3 SMD-1 LCC-20 |

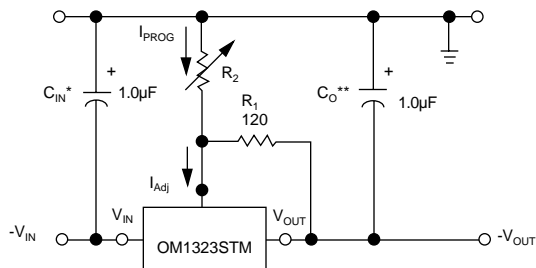


ELECTRICAL CHARACTERISTICS -55°C T_A 125°C, $I_L = 8\text{mA}$ (unless otherwise specified)
OM1323N2M

| Parameter | Symbol | Test Conditions | Min. | Max. | Unit |
|----------------------------------|------------|---|--------|--------|---------------|
| Reference Voltage | V_{REF} | $ V_{DIFF} = 3.0\text{V}, T_A = 25^\circ\text{C}$ | -1.275 | -1.225 | V |
| | | $ V_{DIFF} = 3.0\text{V}$ | -1.30 | -1.20 | |
| | | $ V_{DIFF} = 40\text{V}, T_A = 25^\circ\text{C}$ | -1.275 | -1.225 | V |
| | | $ V_{DIFF} = 40\text{V}$ | -1.30 | -1.20 | |
| | | $ V_{DIFF} = 50\text{V}, T_A = 25^\circ\text{C}$ | -1.275 | -1.225 | |
| | | $ V_{DIFF} = 50\text{V}$ | -1.30 | -1.20 | |
| Line Regulation (Note 1) | R_{LINE} | 3.0 V $ V_{DIFF} $ 40V, $T_A = 25^\circ\text{C}$ | -10 | 10 | mV |
| | | | -25 | 25 | |
| Load Regulation (Note 1) | R_{LOAD} | $ V_{DIFF} = 5.0\text{V}, 8\text{mA } I_L 100\text{mA}$ | -25 | 25 | mV |
| | | $T_A = 25^\circ\text{C}$ | | | |
| | | $ V_{DIFF} = 5\text{V}, 8\text{mA } I_L 500\text{mA}, T_A = 25^\circ\text{C}$ | -31 | 31 | |
| | | | -50 | 50 | |
| Thermal Regulation | V_{RTH} | $V_{in} = -16.25\text{V}, I_L = 330\text{mA}$ $P_d = 5\text{ Watts}, t = 10\text{ ms}, T_A = 25^\circ\text{C}$ | -2 | 2 | mV |
| Ripple Rejection (Note 2) | R_N | $f = 120\text{ Hz}, V_{out} = V_{ref}$ $C_{Adj} = 10\ \mu\text{F}$ | 66 | | dB |
| Adjustment Pin Current | I_{Adj} | $ V_{DIFF} = 3.0\text{V}$ | | 100 | μA |
| | | $ V_{DIFF} = 40\text{V}$ | | 100 | |
| | | $ V_{DIFF} = 50\text{V}$ | | 100 | |
| Adjustment Pin Current Change | I_{Adj} | $ V_{DIFF} = 5\text{V}, 8\text{mA } I_L 200\text{mA}$ | -5 | 5 | μA |
| | | 3 V $ V_{DIFF} $ 50V | -6 | 6 | |
| Minimum Load Current | I_{Lmin} | $ V_{DIFF} = 3.0\text{V}, V_{out} = -1.4\text{V (forced)}$ | | 3.0 | mA |
| | | $ V_{DIFF} = 10\text{V}, V_{out} = -1.4\text{V (forced)}$ | | 3.0 | |
| | | $ V_{DIFF} = 40\text{V}, V_{out} = -1.4\text{V (forced)}$ | | 5.0 | |
| | | $ V_{DIFF} = 50\text{V}, V_{out} = -1.4\text{V (forced)}$ | | 5.0 | |
| Current Limit (Note 2) | I_{CL} | $ V_{DIFF} = 5\text{V}$ | 0.5 | 1.8 | A |
| | | $ V_{DIFF} = 50\text{V}, T_A = 25^\circ\text{C}$ | 0.1 | 0.65 | |

Notes: Please see previous page.

TYPICAL APPLICATIONS



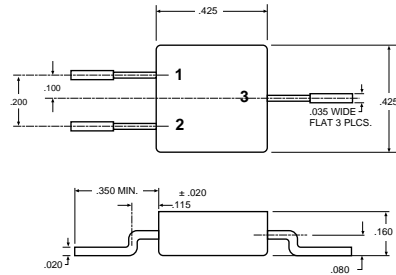
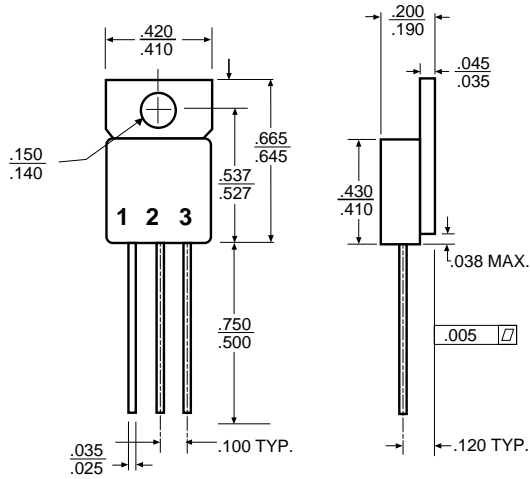
* C_{in} is required if regulator is located more than 4 inches from power supply filter. A 1 μF solid tantalum or 10 μF aluminum electrolytic is recommended.

** C_o is necessary for stability. A 1 μF solid tantalum or 10 μF aluminum electrolytic is recommended.

$$V_{out} = -1.25\text{ V} \left(1 + \frac{R_2}{R_1} \right)$$

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MECHANICAL OUTLINE

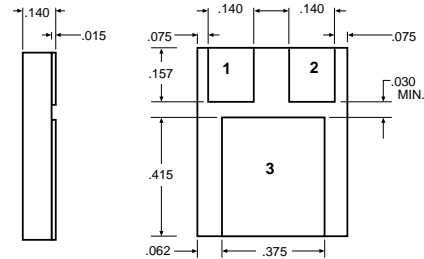


OM1323SMM

Front View
 Pin 1 - Adjust
 Pin 2 - Output
 Pin 3 - Input
 Case - Isolated

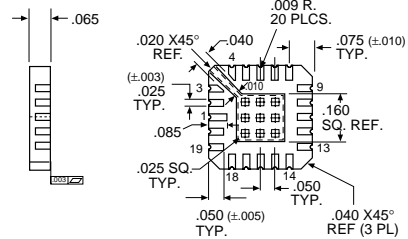
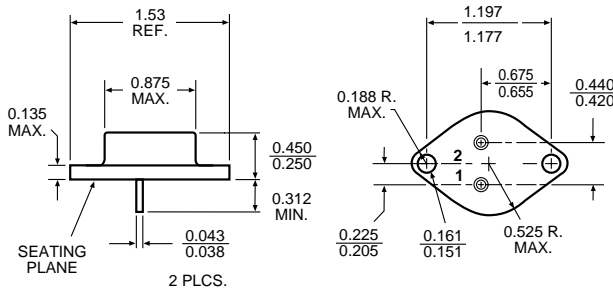
OM1323STM
 Isolated
 Front View
 Pin 1 - Adjust
 Pin 2 - Input
 Pin 3 - Output
 Tab - Isolated

OM1323NTM
 Non-Isolated
 Front View
 Pin 1 - Adjust
 Pin 2 - Input
 Pin 3 - Output
 Tab - Input



OM1323NMM

Pin 1 - Adjust
 Pin 2 - Output
 Pin 3 - Input



OM1323N2M

| | | | |
|--------|-----------------|--------|------------------|
| Pin 1 | V _{IN} | Pin 11 | NC |
| Pin 2 | NC | Pin 12 | V _{OUT} |
| Pin 3 | NC | Pin 13 | V _{OUT} |
| Pin 4 | NC | Pin 14 | NC |
| Pin 5 | NC | Pin 15 | NC |
| Pin 6 | NC | Pin 16 | NC |
| Pin 7 | NC | Pin 17 | NC |
| Pin 8 | NC | Pin 18 | NC |
| Pin 9 | ADJUST | Pin 19 | NC |
| Pin 10 | NC | Pin 20 | V _{IN} |

OM1323NKM
 Pin 1 - Adjust
 Pin 2 - Output
 Case - Input

For additional information please see the mechanical outline section.